

AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A light emitting diode comprising:
- 5 an insulating substrate;
a semiconductor stack positioned over the insulating substrate, the semiconductor stack comprising a first surface and a second surface, a distance between the first surface and the insulating
- 10 substrate is greater than a distance between the second surface and the insulating substrate;
a reverse-tunneling layer over the first surface;
a first transparent ohmic contact electrode positioned directly on the reverse-tunneling layer;
- 15 and
a second transparent ohmic contact electrode positioned over the second surface.
2. (Currently Amended) The light emitting diode of claim
- 20 1, wherein the insulating substrate comprises sapphire, and the first transparent ohmic contact electrode and the second transparent ohmic contact electrode comprise the same non-metal material.
- 25 3. (Previously Presented) The light emitting diode of claim 1, wherein the first transparent ohmic contact electrode or the second transparent ohmic contact electrode comprises at least one selected from a group comprising indium tin oxide (ITO), cadmium tin oxide
- 30 (CTO), and titanium-tungsten nitride (TiWN).
4. (Cancelled)

- C'
5. (Original) A light emitting diode comprising:
- an insulating substrate;
 - a buffer layer positioned on the insulating
 - 5 substrate;
 - an n⁺-type contact layer positioned on the buffer layer, the contact layer comprising a first surface and a second surface;
 - an n-type cladding layer positioned on the first
 - 10 surface of the n⁺-type contact layer;
 - a light-emitting layer positioned on the n-type cladding layer;
 - a p-type cladding layer positioned on the light-emitting layer;
 - 15 a p-type contact layer positioned on the p-type cladding layer;
 - an n⁺-type reverse-tunneling layer positioned on the p-type contact layer;
 - a p-type transparent ohmic contact electrode
 - 20 positioned on the n⁺-type reverse-tunneling layer; and
 - an n-type transparent ohmic contact electrode positioned on the second surface of the n⁺-type contact layer;
 - wherein the p-type transparent ohmic contact
 - 25 electrode and the n-type transparent ohmic contact electrode comprise the same materials.
6. (Original) The light emitting diode of claim 5 wherein the insulating substrate comprises sapphire.
- 30
7. (Original) The light emitting diode of claim 5 wherein the p-type transparent ohmic contact electrode and the

n-type transparent ohmic contact electrode are made of at least one selected from a group comprising indium tin oxide, cadmium tin oxide, and titanium-tungsten nitride.

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8. (Cancelled)

9. (Cancelled)

- C1
- 10 10. (New) A light emitting diode comprising:
an insulating substrate;
a semiconductor light emitting stack positioned over the insulating substrate, the semiconductor light emitting stack comprising a first surface and a second surface, a distance between the first surface and the
15 insulating substrate is greater than a distance between the second surface and the insulating substrate;
a first non-metal transparent ohmic contact
20 electrode positioned over the first surface; and
a second non-metal transparent ohmic contact electrode positioned over the second surface,
wherein the first non-metal transparent ohmic contact electrode and the second non-metal transparent
25 ohmic contact electrode comprise the same material.

11. (New) The light emitting diode of claim 10, wherein the first non-metal transparent ohmic contact electrode and the second non-metal transparent ohmic
30 contact electrode comprise at least one selected from a group comprising indium tin oxide (ITO), cadmium tin oxide (CTO), and titanium-tungsten nitride (TiWN).

12. (New) A light emitting diode comprising:

an insulating substrate;

5 a semiconductor stack positioned over the insulating substrate, the semiconductor stack comprising a first surface and a second surface, a distance between the first surface and the insulating substrate is greater than a distance between the second surface and the insulating substrate;

C' 10 a reverse-tunneling layer, which has a carrier concentration of approximately $1.5 \times 10^{20} \text{ cm}^{-3}$, over the first surface;

a first transparent ohmic contact electrode directly on the reverse-tunneling layer; and

15 a second transparent ohmic contact electrode over the second surface.

13. (New) The light emitting diode of Claim 12, wherein the reverse-tunneling layer has a thickness of
20 approximately 20 angstroms.

14. (New) A light emitting diode comprising:

an insulating substrate;

25 a semiconductor stack positioned over the insulating substrate, the semiconductor stack comprising a first surface and a second surface, a distance between the first surface and the insulating substrate is greater than a distance between the second surface and the insulating substrate;

30 a reverse-tunneling layer over the first surface; and

a first transparent ohmic contact electrode directly on the reverse-tunneling layer.